

WHAT IS CLAIMED IS:

1. A process for manufacturing a flexible pipe comprising:
forming an innermost layer of a flexible pipe wherein the innermost layer comprises a crosslinkable material;
crosslinking the material comprising the innermost layer by exposing the innermost layer to electron beam radiation;
forming at least one supporting layer around the innermost layer, wherein the supporting layer comprises a material selected from the group consisting of thermosetting materials, thermoplastic materials, non-plastic materials, metal strips, tape and wires; and
2. The process of claim 1 wherein the electron beam radiation is supplied by at least three electron beam accelerators arranged so that the entire surface of the innermost layer is exposed to the electron beam radiation.
3. The process of claim 2 wherein the electron beam accelerators are radially spaced apart and arranged about 120 degrees apart with respect to each other.
4. The process of claim 2 wherein each electron beam accelerator is operated in a range of about 150 kilovolts to about 6 megavolts.
5. The process of claim 1 wherein the radiation is between about 3 megarads and about 35 megarads.
6. The process of claim 1 wherein the radiation is between about 8 megarads and about 20 megarads.
7. The process of claim 1 wherein the irradiation is carried out from between 0° C and about 60° C.
8. The process of claim 1 wherein the crosslinking results in the innermost layer having a gel content between about 50% and 94%.

9. The process of claim 1 wherein the crosslinking of the innermost layer comprises:
passing the innermost layer through an enclosure in which at least three electron beam accelerators are arranged so as to expose the innermost layer to electron beam radiation on its surface.
10. The process of claim 9 further comprising passing the pipe through the enclosure repeatedly, until a desired level of crosslinking is achieved.
11. The process of claim 1 wherein the forming of the innermost layer further comprises coating a carcass with the innermost layer prior to the crosslinking of the innermost layer.
12. The process of claim 11 wherein the crosslinking of the innermost layer comprises:
passing the carcass with the innermost layer coated thereon through an enclosure in which at least three electron beam accelerators are arranged so as to expose the carcass with the innermost layer coated thereon to electron beam radiation.
13. A flexible pipe comprising:
an innermost layer comprising a crosslinked polyethylene layer that was crosslinked by exposure to electron beam radiation; and
at least one supporting layer around the innermost layer, wherein the supporting layer comprises a material selected from the group consisting of thermosetting materials, thermoplastic materials, non-plastic materials, metal strips, tape and wires.
14. The flexible pipe of claim 13 further comprising:
a metal carcass on which the innermost layer is formed prior to crosslinking.
15. The flexible pipe of claim 13, having a diameter of between 50 mm to 500 mm.
16. The flexible pipe of claim 13, wherein the flexible pipe has allowable internal pressures of between 50 bar and 1000 bar.